

Amendment to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A method for diagnosing abnormality and estimating degradation in a valve apparatus, comprising the steps of:

connecting a ~~driving force~~ torque sensor provided to a driving portion of a valve apparatus to a diagnosing apparatus, provisionally fitting ~~an energy~~ current sensor for detecting ~~feed energy~~ an electric current to said driving portion and a vibration sensor for detecting vibration of said valve apparatus to said valve apparatus;

converting detection signals outputted from said three kinds of sensors to predetermined signals in a data conversion unit;

conducting an analytical diagnosing processing of diagnostic data information for each diagnostic item by referring to an allowance value of each diagnostic item calculated from the specification of said valve apparatus and set in advance, and to a maintenance record inclusive of the diagnostic result to judge whether said valve apparatus is normal or abnormal, said diagnostic data information including at least data about aptitude evaluation of torque of the driving portion, data about aptitude evaluation of seat force of the driving portion, data about aptitude evaluation of sliding drag of the driving portion, data about aptitude evaluation of time between opening and closing of a valve, data about aptitude evaluation of wear and loosening of said valve apparatus, and data about aptitude evaluation of a limit stop position of the valve;

conducting further degradation estimation by conducting calculation with past diagnostic results, and preparing a future maintenance plan, thereby making it possible to conduct diagnosis from outside without opening and disassembling said valve apparatus and without cutting off the energy source even during operation of said valve apparatus.

2. (canceled)

3. (currently amended) A method ~~for diagnosing abnormality and estimating degradation in a valve apparatus~~ according to claim 1 ~~or 2~~, wherein said data is are collected a plurality of times with time intervals for each of said data ~~described in claim 2~~, and when the result of the diagnosis is recorded, degradation estimation is conducted on the basis of said result of diagnosis to generate said future maintenance plan.

4. (canceled)

5. (canceled)

6. (canceled)

7. (currently amended) An apparatus for diagnosing abnormality and estimating degradation in a valve apparatus, comprising:

~~a data conversion unit including a driving force~~torque sensor mounted on a driving portion of the valve apparatus for detecting torque of the driving portion;

~~a current sensor for detecting driving force of a driving portion, built in said driving portion of a valve apparatus and connected to a diagnosing apparatus, an energy sensor for detecting feed energy~~an electric current to said driving portion and;

~~a vibration sensor for detecting vibration of said valve apparatus that are,~~said current and vibration sensors being provisionally fitted to said valve apparatus;~~said;~~

~~a data conversion unit being used~~connected to said three sensors for converting detection signals outputted from said three kinds of sensors to predetermined signals; and

~~a processor connected to said data conversion unit, for collecting data, preserving-accumulation of maintenance records including an allowance value of each diagnostic item calculated from the specification of said valve apparatus and set in advance, and the diagnostic result, conducting an analytical diagnosing processing of diagnostic data information for each diagnostic item to judge whether said valve apparatus is normal or abnormal,~~said diagnostic data information including at least data about aptitude evaluation of torque of the driving portion, data about aptitude evaluation of seat force of the driving portion, data about aptitude evaluation of sliding drag of the driving portion, data about aptitude evaluation of time

between opening and closing of a valve, data about aptitude evaluation of wear and loosening of said valve apparatus, and data about aptitude evaluation of a limit stop position of the valve, conducting further degradation estimation while conducting calculation with past diagnostic results, and preparing a future maintenance plan, thereby making it possible to conduct diagnosis from outside without opening and disassembling said valve apparatus and without cutting off the energy source even during operation of said valve apparatus.

8. (canceled)

9. (currently amended) An apparatus ~~for diagnosing abnormality and estimating degradation in a valve apparatus~~ according to claim 7 ~~or 8~~, wherein said data is are collected a plurality of times with time intervals for each of said data ~~described in claim 8~~, and when the result of the diagnosis is recorded, degradation estimation is conducted on the basis of said result of diagnosis to generate said future maintenance plan.

10. (canceled)

11. (canceled)

12. (canceled)